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ABSTRACT

A quasi-experimental study explored the ways in which the full-day kindergarten program is beneficial and/or detrimental to students compared to the half-day and/or extended-day program. The sample consisted of six full-day schools matched with half-day schools on geographic location, school size, student norm-referenced data, and socioeconomic status of patrons. Data were collected by means of classroom observations; video- and audiotaped interviews of students, teachers, and parents; report cards of all students included in the sample; survey questionnaires administered to parents and teachers; and a norm-referenced achievement test administered to all students. The findings revealed the following: (1) greater utilization of small group activities by the full-day programs; (2) no significant difference in the amount of fatigue experienced by full-day and half-day students; (3) greater number of social interactions was experienced by full-day students; (4) full-day students outperformed half-day students on the majority of the Language Arts criteria and a few of the criteria used to measure mathematics skills; (5) full-day students outperformed half-day students on every criterion measured by norm-referenced achievement test; (6) overall satisfaction was higher for parents of children attending full-day and extended day programs (they believed that their children had a better chance for success in first grade over the half-day students); and (7) school attendance of full-day students was more regular than for other students. (BA)

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THE EFFECTS OF FULL-DAY KINDERGARTEN ON STUDENT ACHIEVEMENT AND AFFECT

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ABSTRACT

Data from this quasi-experimental study indicate several significant advantages of the full-day kindergarten program over the half- and/or extended-day programs. While kindergarten curricula are relatively similar across all classrooms, instructional practices vary in several significant and important ways. Students enrolled in full-day programs receive more small group and individualized instruction than their half-day counterparts and often participate in a greater variety of activities, including outdoor activities. Attendance was found to be significantly higher, and fatigue, sometimes assumed to be a problem for children attending full-day, is not a significant factor. Fewer than 8% of all students have been identified by parents, teachers, or independent observers as experiencing significant loss of engagement in school.

Parents and teachers overwhelmingly favor full-day programs (98%) over half- or extended-day, citing improved learning and school socialization skills as benefits. Perhaps the most "telling" feature, however, is that **full-day kindergarten students consistently outperform half- and extended-day students on criterion- and norm-referenced achievement measures**.

Background

Early childhood education has changed dramatically in recent decades. What began as a way to provide for only the most basic needs of young children of working parents is now an organized system of education and care. This system is large and varied, providing a multitude of options for families in today's ever-changing world. One educational option for children and families is kindergarten. Kindergarten has been usually presented to families in half- and full-day formats. Half-day kindergarten programs became prevalent in the 1950's and continue in many communities, often because of cost and space issues. The single greatest factor distinguishing half- and full-day programs is community preference regarding perceptions of the readiness level of five-year-olds (Puleo, 1988).

With the increase in kindergarten programs, increased attention has followed from both early childhood professionals and the public at local, state, national, and international levels. The reasons for this attention are varied and, perhaps, led by America 2000's first goal and accompanying objectives of ensuring that all children starting school are ready to learn (Kagan, 1994).

Research Questions

The central question posed in this study asks, "In what way(s) is the full-day kindergarten program beneficial and/or detrimental to students as compared to the half-day program (with and/or without an accompanying extended-day)?" From this general

quarry, the following research questions were addressed:

(1) How does length of school day affect kindergarten curricula and instruction?

(2) Do students attending full-day kindergarten experience more fatigue than students attending half-day?

(3) Does length of school day affect kindergarten students' socialization skills?

(4) Do kindergarten students score higher on criterion-referenced measures when attending full-day rather than half-day?

(5) Do kindergarten students score higher on norm-referenced achievement tests (or learn more) when attending full-day rather than half-day sessions?

(6) What do parents and teachers of kindergarten students view as benefits or shortcomings to children who attend full- or half-day programs?

(7) Do attendance patterns differ among full-, half-, and extended-day students?

Methodology

Sample Selection

A matched-pairs design was used. Demographic data on 6 pilot schools chosen by the Springfield, Missouri, Public Schools was obtained. Stratification on geographic location, school size, student norm-referenced test data, and socio-economic status of patrons was considered in order to select a comparable control group consisting of 7 schools, plus one alternate. Table 1 shows the schools included in the sample with accompanying descriptive data; Table 2 shows student scores on Missouri KIDS, hereafter referred to as (KIDS), a student norm-referenced test administered at the beginning of the kindergarten year.

Design

A number of qualitative and quantitative methodologies were employed to address the research questions posed by this quasi-experimental study. The various methods were initiated by the research team in October 1994 and concluded in June 1995.

Table 1. Schools Included in Sample [by Geographic Location (GL), Size, and Socio-Economic Status (SES) -- Reported as Percentage of Students Receiving Free and/or Reduced Lunches].

Full-day Kindergarten Schools	GL	Size	SES	Half-day Kindergarten Schools	GL	Size	SES
York	NW	294	79.2%	Bowerman*	NW	300	77.1%
Pepperdine	NE	168	68.2%	Shady Dell*	NE	164	60.7%
Sunshine	C	266	25.7	Rountree	C	281	34.6%
Cowden	S	244	30.8%	Holland**	S	250	31.5%
Pershing	SE	183	15.8%	Sequiota	SE	210	8%
Gray	SW	576	6.1%	Jeffries	SW	562	13.1%
				Westport*	NW	500	72.4%

[*These half-day schools included extended-day programs. **Because Holland's report cards are different in form and content from other schools in the sample, Pittman School was substituted for report card analysis only.]

Qualitative data were content analyzed by university faculty. Quanitiative data were entered into DBASE IV and transferred into SPSS PC+ for statistical analyses. Analyses included frequency distributions, independent samples t-tests, Chi Square statistics, analysis of variance (ANOVA), multiple analysis of variance (MANOVA), multiple regression, and discriminant analysis.

The following data collection approaches were utilized:

(1) Observations. -- (150) hour-long observations were scheduled for the 25 classrooms

(2) Kindergarten Students' Focus Group. -- video-taped focus group interview with seven kindergarten students attending full-day classes

(3) Teacher Focus Group. -- seven teachers participating in full-day kindergarten programs in the experimental group responded to questions in a 45 minute audio-taped focus group interview

(4) Parent Focus Group. -- seven parents of children attending full-day kindergarten responded to questions in a 45-minute audio-taped session

(5) Criterion-Referenced Measures. -- report cards from all students included in the sample were collected and analyzed.

(6) Survey Questionnaires. -- survey questionnaires were administered to parents and teachers, n = 407.

(7) Student Norm-Referenced Achievement Test. A norm-referenced achievement test (*Early Childhood System / Early School Assessment -- Level 2*, Macmillan / McGraw-Hill School Publishing Company, 1990) was administered to all kindergarten students in experimental and control groups.

Findings

Question 1. How does length of school day affect kindergarten curricula and instruction?

The length of school day has not significantly altered the curriculum; however, certain instructional approaches do differ. This finding is documented by the observational data, focus group interviews, and open-ended responses to the survey questionnaires.

Students attending full-day kindergarten received the same curricula as their half-day counterparts. Full-day programs tend to utilize more small group activities than half- and/or extended-day programs $F(2,176) = 3.13$, ($p = .048$). It would be reasonable to assume that one reason for this is that extra time allows for more small group and individual activities to take place as teachers feel less pressured by time to convey information expediently, i.e., to the entire group.

Question 2. Do students attending full-day experience more fatigue than students attending half-day?

Incidence of fatigue has not been observed as a function of the full-day kindergarten program. When a Chi Square statistic and analysis of variance were applied to the observational data, no significant difference was found: $X^2(10) = 7.14$ ($p = .71$); $F = 1.07$ ($p = .67$).

Question 3. Does length of school day affect socialization skills?

A significantly greater number of child-to-child social interactions is taking place in the full-day program as compared to the half-day program, $X^2(10) = 20.82$ ($p = .022$). This finding would seem reasonable, given the increase in time and noting that the significant difference is between full- and half-day, not full- and extended-day. Content analyses of the open-ended responses from the parent survey questionnaires confirm this finding. However, while the number of social interactions is greater for

students attending full-day, the "quality" of these interactions was not ascertained, and criterion measures failed to produce significant differences. The answer to this question remains inconclusive.

Question 4. Do kindergarten students score higher on criterion-referenced measures when attending full-day rather than half-day?

Data indicate that full-day kindergarten students outperformed half-day students on 8 of the 9 Language Arts (Reading) criteria. Of these, awareness of printed symbols yielded the greatest mean difference (+.28) at the greatest degree of significance ($p < .0001$). Three of the criteria differences were not statistically significant.

Full-day kindergarten students outperformed half-day students on 8 of the 11 criteria. Of the remaining three, one criterion indicated no difference, and the other two were not significant. Of the 13 criteria used to measure mathematics skills, only 2 statistically significant results were found, both favoring full-day students.

Table 6. ANOVA Results for Report Card Data: Language Arts N = 511.

Criterion	Mean	Diff.	F value	Significance
Displays an interest in books	f = 3.85 h = 3.85	0	-	not significant
Listens attentively to stories	f = 3.81 h = 3.73	+.03	-	not significant
Demonstrates comprehension of story read aloud	f = 3.82 h = 3.68	+.14	8.85	p = .003
Has book knowledge (ex. where a story begins and ends, cover, title, etc.)	f = 3.86 h = 3.83	+.03	-	not significant
Reads sequence of pictures	f = 3.85 h = 3.72	+.13	7.16	p = .008
Is aware of printed symbols	f = 3.83 h = 3.55	+.28	28.03	p < .0001
Demonstrates awareness in letter-sound relationships	f = 3.64 h = 3.47	+.17	5.78	p = .017
Names upper and lower case letters	f = 3.82 h = 3.70	+.12	4.08	p = .044
Reads a story he/she has written/dictated	f = 3.41 h = 3.32	+.09	-	not significant

Table 7. ANOVA Results for Report Card Criteria: Language Arts -- Language Skills / Listening and Speaking and Writing Process. N = 511.

Criterion	Mean	Diff.	F value	Significance
Listens to peers	f = 3.62 h = 3.62	0	-	not significant
Listens to adults	f = 3.67 h = 3.70	-.03	-	not significant
Interprets pictures	f = 3.85 h = 3.73	+.12	6.56	p = .011
Retells several events in a story	f = 3.82 h = 3.64	+.18	11.14	p = .001
Contributes ideas to group discussions	f = 3.74 h = 3.67	+.07	-	not significant
Expresses ideas and thoughts speaking in complete sentences	f = 3.86 h = 3.91	-.05	-	not significant
Follows two or three sequential directions	f = 3.77 h = 3.59	+.18	8.34	p = .004
Recalls poems, finger plays and songs	f = 3.85 h = 3.71	+.14	6.77	p = .010
Recognizes rhyming patterns	f = 3.75 h = 3.68	+.07	-	not significant
Expresses thoughts using words and pictures	f = 3.50 h = 3.48	+.02	-	not significant
Creates a story of one or more thoughts	f = 3.35 h = 3.29	+.06	-	not significant

Table 8. ANOVA Results for Report Card Criteria: Mathematics. N = 511.

Criterion	Mean	Diff.	F value	Significance
Sort and classify objects by shape, color, size	f = 3.90 h = 3.97	-.07	-	not significant
Name shapes	f = 3.88 h = 3.96	-.08	-	not significant
Make comparisons - more/less, greater/fewer	f = 3.89 h = 3.92	-.04	-	not significant
Interpret simple graphs	f = 3.88 h = 3.80	+.08	-	not significant
Sequence a set of graduated objects	f = 3.90 h = 3.89	+.01	-	not significant
Produce and extend patterns	f = 3.89 h = 3.93	-.04	-	not significant
Count numbers 0 - 31	f = 3.85 h = 3.93	-.08	-	not significant
Recognize, in/out of sequence, numbers 0 - 31	f = 3.67 h = 3.61	+.06	-	not significant
Demonstrate an understanding of number values 0 - 31	f = 3.71 h = 3.65	+.06	-	not significant
Make reasonable predictions with numbers	f = 3.59 h = 3.42	+.17	6.51	p = .014
Sort and classify money (pennies, nickels, dimes, quarters)	f = 3.65 h = 3.66	-.01	-	not significant
Perform basic addition and subtraction tasks	f = 3.62 h = 3.46	+.16	5.81	p = .016
Solve word problems presented orally	f = 3.59 h = 3.53	+.06	-	not significant

Table 9. ANOVA Results for Report Card Criteria: Personal Development -- Independence and Personal Care / Health. N = 511.

Criterion	Mean	Diff.	F value	Significance
Focuses on tasks	f = 3.61 h = 3.61	0	-	not significant
Follows through on classroom tasks	f = 3.61 h = 3.69	-.08	-	not significant
Works well independently	f = 3.58 h = 3.59	-.01	-	not significant
Seeks help when needed	f = 3.72 h = 3.78	-.06	-	not significant
Shows pride in efforts	f = 3.73 h = 3.80	-.07	-	not significant
Evaluates own work	f = 3.53 h = 2.80	+.73	43.20	$p < .0001$
Responsible for personal needs and belongings	f = 3.69 h = 3.76	-.07	-	not significant
Practices preventive health habits (e.g., washing hands, covering mouth)	f = 3.82 h =3.69	+.13	6.16	$p = .013$
Practices safety rules	f = 3.73 h = 3.77	-.04	-	not significant

Table 10. ANOVA Results for Report Card Criteria: Social & Physical Development. N = 511.

Criterion	Mean	Diff.	F value	Significance
Works / plays cooperatively in a small group	f = 3.63 h = 3.70	-.07	-	not significant
Works / plays cooperatively in a large group	f = 3.59 h = 3.63	-.04	-	not significant
Works without interrupting the learning of others	f = 3.44 h = 3.49	-.05	-	not significant
Tries to resolve conflicts appropriately	f = 3.53 h = 3.70	-.17	7.51	p = .006
Respects school rules	f = 3.59 h = 3.68	-.09	-	not significant
Accepts responsibility for own actions	f = 3.57 h = 3.69	-.12	-	not significant
Shows whole body coordination (e.g., running, balancing)	f = 3.61 h = 3.78	-.17	9.50	p = .002
Displays small muscle control (e.g., cutting, folding, writing)	f = 3.55 h = 3.43	+.12	-	not significant

Table 11. ANOVA Results for Early School Assessment Norm-Referenced Achievement Test. N = 511.

Criterion	Mean	Diff.	F value	Signif.
Language	f = 20.06 h = 19.39	+.67	8.32	p = .004
Visual	f = 16.34 h = 15.67	+.67	7.97	p = .005
Auditory	f = 22.63 h = 21.69	+.94	4.76	p = .030
Mathematical concepts and operations	f = 34.09 h = 33.08	+1.01	8.05	p = .005
Memory	f = 19.04 h = 18.30	+.74	6.39	p = .012
Total Scaled Score for Reading	f = 74.63 h = 67.22	+7.41	9.37	p = .002
Total Scaled Score for Mathematics	f = 75.84 h = 67.89	+7.95	11.26	p = .001
Normal Curve Equivalency for Reading	f = 68.60 h = 62.53	+6.07	10.52	p = .001
Normal Curve Equivalency for Mathematics	f = 69.82 h = 63.49	+6.33	11.32	p = .001

Question 5. Do kindergarten students score higher on norm-referenced achievement tests (or learn more) when attending full-day rather than half-day sessions?

Full-day students outperformed half-day students on every criterion measured by the Early School Assessment norm-referenced achievement test. While all categories are statistically significant, the total scaled scores on reading and mathematics as well as the normal curve equivalencies are the most highly significant.

Question 6. What do parents and teachers of kindergarten teachers view as benefits or shortcomings to students who attend full- or half-day programs?

Parents expressed high levels of satisfaction (regardless of whether their children are attending full-, half- or extended-day kindergarten programs). Even so, six significant differences exist. Of these, overall satisfaction is higher for parents of children attending full-day and extended day programs. These same parents believe the full-day or extended-day programs increased their children's chances for success in first grade $F = 4.08$, ($p = .02$) over the half-day program. The most highly significant difference is that parents of children attending full-day session noted that teachers gave suggestions and ideas to use at home more frequently than in either half- or extended-day settings.

Of the 417 parent survey questionnaires returned and analyzed, 11% with children in full-day programs reported their child had attended less than the full year, compared to 10% for half-day and 9% for extended-day.

Table 12. ANOVA Results, Means, Standard Deviations for Parent Survey Questionnaire Variables Assessing Kindergarten Programs. n = 417.

Variable	F[a] M & (SD)	H[b] M & (SD)	E[c] M & (SD)	C[d] M & (SD)	F	Sig. p =
Enthusiasm for books or being read to at home	5.75 (.55)	5.60 (.80)	5.55 (.63)	5.65 (.71)	-	ns
Increased chances for success in first grade	5.63 (.66)	5.41 (1.00)	5.73 (.50)	5.52 (.86)	4.08	.02
Enthusiasm for counting, adding, "how many" at home	5.60 (.62)	5.48 (.84)	5.39 (.69)	5.51 (.75)	-	ns
Satisfaction with program	5.61 (.65)	5.30 (1.10)	5.61 (.58)	5.44 (.93)	5.42	.005
Understand activities done and benefit to my child	5.53 (.63)	5.35 (.84)	5.30 (.85)	5.41 (.77)	3.22	.04
Looks forward to attending kindergarten each day	5.38 (.87)	5.39 (.89)	5.46 (.63)	5.40 (.86)	-	ns
Positive working relationship with child's teacher	5.52 (.78)	5.31 (1.02)	5.25 (.89)	5.38 (.93)	-	ns
Child's progress effectively and sufficiently reported	5.43 (.87)	5.30 (.93)	5.25 (.87)	5.34 (.90)	3.21	.04
Enthusiasm for writing at home	5.34 (.99)	5.04 (1.20)	5.16 (.81)	5.16 (1.09)	3.33	.04)
Teacher gave suggestions and ideas to use at home	5.26 (.90)	4.85 (1.15)	4.89 (.99)	5.00 (1.07)	6.98	.001
Complaints of being sleepy or very tired after school[1]	2.39 (1.44)	2.06 (1.23)	2.61 (1.47)	2.23 (1.35)	-	ns
Grand M & (SD)	5.51 (.75)	5.30 (.98)	5.36 (.74)	5.38 (.89)	3.20	.05

[Note: ([a]F = Full-day; [b]H = Half-day; [c]E = Extended-day; [d]C = Full- Half- and Extended-day Combined); (ns = not significant); ([1]Excluded from calculation of grand mean); (Scale: 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree.)]

Parents of children in the half-day program frequently commented that although they were satisfied with their child's half-day program, they would have preferred the full-day kindergarten option. Parents commented that, at times, they feel their children are rushed during the half-day program. There were a variety a curriculum concerns noted by these parents, but these did not appear to be related to the half- or full-day program. These concerns also included large class size. Finally, many parents expressed their enjoyment for having their children at home the other half of the day.

Parents with children in the extended-day program were generally pleased with the program in which their child was placed, but many stated they would have preferred their child to be in a full-day program. Other groups (parents against full-day kindergarten, and teachers in all kindergarten programs) did not have enough responses to form trends but comments are noted below.

Parents against full-day kindergarten stated that they wanted their children to spend more time with them and wanted a choice of the types of programs their children entered. Teachers in the half-day programs were concerned about their large class size and felt that the half-day session was not beneficial to the children, noting teachers are often rushed. Teachers in the extended-day programs stated that the children in their classes who did not stay all day wanted to remain for the entire day, and the children who did stay usually did better on their class work. Teachers in the full-day program felt that the children had time to be successful without being rushed. These teachers believed their children made excellent progress and enjoyed the flexibility of having more time to spend on activities.

Through the analysis of parent's written comments several trends are noted. Generally, parents and teachers appear supportive of the full-day kindergarten program. The belief, expressed by parents and teachers, is that children have more time to explore the curriculum and are not rushed. Also, most families did not feel that the length of the school day had any effect on after school activities. Children, regardless of the type of program they were in, participated in the same types of activities outside school. A relatively small group of parents did not support the concept of full-day kindergarten. Most of these parents expressed a desire to have a choice of the type of program their child attended and wanted to spend more time at home with their child.

Question 7. Do attendance patterns differ among full-, half-, and extended-day students?

Full-day kindergarten students attended more regularly than either their half- or extended-day counterparts. Full-day students attended, on average, 40 hours more throughout the school year. This difference is significant: $F = 34.547$, ($p < .0001$).

One possible explanation for higher attendance rates for full-day students might be that parents approach the full-day program more seriously and are therefore more reluctant to take their children out of school. In other words, it might be perceived that students' missing a day of half-day is not as crucial as missing a day of full-day.

Conclusions

Students attending full-day kindergarten experience a wider range of benefits than their half- or extended-day counterparts. The scientific evidence provided, here, favors full-day on virtually every dimension.

Policy implications:

(1) If a decision to implement either a full- half- or extended-day kindergarten program were based on educational issues, full-day would be the program of choice. The basis for this decision is unequivocal and documented with a level of confidence that is rare for educational research.

(2) If a decision to implement either a full- half- or extended-day kindergarten program were based on conventional wisdom or community preference, full-day would be the program of choice. This study suggests that more than 98% of parents with children of kindergarten age would prefer a full-day program.

(3) If a decision to implement either a full- half- or extended-day kindergarten program were based on professional judgment (i.e., teacher beliefs), full-day would be the program of choice. Teachers cite a variety of instructional strategies that are augmented by full-day programs.

(4) If a decision to implement either a full- half- or extended-day kindergarten program were based on social / societal issues, the decision would be equivocal. That is, data produced in this study regarding kindergarten children's social skill acquisition or development, or socialization to schooling, relative to full-, half-, or extended-day programs are inconclusive.